

Employee-driven Digital Innovation in Public Organizations – A Case Study

Research Paper

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Abstract

In this paper, we examine the phenomenon of employee-driven digital innovation in a public-sector context. Using a qualitative research design, we aim to identify institutional, organizational and individual drivers and barriers to employee-driven digital innovation, with a Norwegian municipality as our focal point of study. The research was conducted by interviewing eleven employees with different connections to four digital innovation projects in the municipality. The aim of this research is to establish the innovation drivers and barriers that exist in the public sector in relation to employee-driven digital innovation, in order to increase insight into these innovation processes for both academics and practitioners.

Keywords: Employee-driven digital innovation; digital innovation; public management.

Introduction

Globalization, internationalization and technological development are among the forces that are increasingly affecting organizations of different sizes, both private and public, in the context of digital innovation and value creation (Janssen et al., 2017; Nambisan et al., 2017; Pappas et al., 2018). To cope with these dynamic and challenging environments, organizations have applied different strategies, including innovation (Chen and Tsou, 2007). In the past, innovation has been associated with the private sector, but lately there has also been increasing interest in innovation in the public sector (Walker, 2014). The innovation focus in the public sector has mainly targeted the goals of increased quality in the provision of public services (Damanpour and Schneider, 2009). A strong force in this respect has been technological development, and, in particular, digitalization. Improving the quality of service delivery has been one of the contributions of digitalization to the public sector, with efficiency as a hidden goal.

There is also an increasing focus on digital innovation within the public sector (Reibenspiess et al., 2019), and in particular, according to Tate et. al. (2018), a worldwide interest in public-sector service innovation. This phenomenon is driven by factors including: a changing population profile with different service needs; increasing use of digital platforms; a decreasing appetite for big government; and a move towards contestable, community-based or public-private hybrid models (Tate et al, 2018). Like the private sector, the public sector needs digital innovation to both deliver good quality services to its citizens

and streamline its work processes in order to minimize public spending. Public-sector employees can play an important role in the realization of these two main objectives. This is for two reasons: firstly, their knowledge of the relevant work processes allows them to identify areas where there are opportunities to improve services or where changing work processes can provide benefits to both residents and the organization. Secondly, their close contact with citizens/users of the services gives them in-depth knowledge about the needs of those users, who can provide valuable input into the development of services for them. In other words, the knowledge and experience that employees possess can be beneficial in creating cost-effective solutions that streamline the digital work processes of public companies and can also help to create innovative and timely services that citizens desire and value.

Both public and private organizations are investigating open innovation processes, which means that valuable ideas can emerge both internally within organizations and externally outside them (Chesbrough and Spohrer, 2006). Utilizing the innovative potential of ordinary employees and linking this to the exploration or exploitation of new digital technology are essential to facilitate employee-driven digital innovation. We define employee-driven digital innovation as ordinary employees driving the process of initiation, selection, experimentation, development and implementation of ideas to create new digital products, services or processes or the use of digital tools that support the innovation processes.

According to Rogers (2003), innovation is an idea, practice or object that is perceived as new by an individual or another unit of adoption. This can be seen as a broad definition of innovation. If we build on Rogers (2003), we can define digital innovation as a digital idea, practice or object that is perceived as new by an individual or another unit of adoption. Innovation within private and public organizations is, however, characterized by several differences. Firstly, the focus between products or services (Lee et al., 2012). Secondly, the focus between utilizing public funds or creating competitive advantage (Kankanhalli et al, 2017). Thirdly, the challenge of innovation in public organizations which often take place in silos, because of lack of integrated approach across public-sector entities (Bertot et al., 2008).

Literature reviews on employee-driven digital innovation (Opland et al., 2020) has stated a need for more research devoted to understanding this phenomenon in public organizations. Our aim in this paper is therefore to explore which drivers and barriers that can be identified in relation to employee-driven digital innovation in a public sector context. To gain the empirical knowledge needed to do this, we have developed the following research question:

What drivers and barriers exist that enhance or hinder employee-driven digital innovation in a public organization?

The paper is structured in the following way. In Section 2 we present the literature and theory related to the research field, before we describe the research method used in Section 3. In Section 4, we will present the findings and then discuss them in relation to the related literature and theory in Section 5, Finally, in Section 6, we present the conclusion and the implications of our findings.

Related Work

Innovation in the Public Sector Context

Research into innovation typically takes a business perspective, with a stronger focus on private organizations than public ones (Bugge and Bloch, 2016). Demircioglu and Audretsch (2017) point out that if one searches for definitions of innovation, most are related to the private sector. According to Walker (2014), researchers and practitioners both now have an increased interest in public-sector innovation, leading to more publications on this topic (De Vries et al, 2016). There has for a long time been a perception that public organizations are less interested in innovation (Rainey et al., 1976). However, innovation has been increasing in public organizations, as a consequence of the challenges that they face (Sørensen and Torfing, 2011). There now seems to be a general understanding that innovation can improve the quality of services in the public sector and enhance its capacity to solve problems (Damanpour and Schneider, 2009).

In their literature review, De Vries et al. (2016) summarize research into innovation in public organizations. The most important finding of this study shows that the main emphasis of innovation in public organizations is processes (almost 50%). Service innovation in the public sector is represented by only 22% of existing studies. These studies are characterized by a focus on realizing the goals of increased effectiveness and efficiency. Surprisingly, however, approximately 35% of the studies do not state the goal for their innovations. De Vries et al. (2016) also identify the antecedents of innovation in public organizations, at the individual, organizational and environmental levels. At the individual level, employee autonomy, organizational position and job-related knowledge and skills are the most prominent antecedents. At the organizational level, the most important antecedents are resource slack, leadership styles, degree of risk aversion and incentives. Finally, at the environmental level, it seems as if environmental pressure, inter-organizational relationships and regulatory aspects are the most important. The public sector increasingly faces complex problems which must be solved (such as how to build sustainability in its service delivery), leading to growing demand for better services.

Digital Innovation

The public sector needs increasingly to use digital technology in the design of its services (Hanna, 2018), so that it can fundamentally transform the development of those services (Nambisan et al. 2017; Fichman et al. 2014). This can be interpreted as a democratization of the innovation process, compared to the traditional research-based approaches to innovation. Nambisan et al. (2017) also argue that the characteristics of innovation will change as a result of digital technology, which creates opportunities for novel actors with distinct goals, skills or knowledge to become involved in new types of value creations. Fichman et al. (2014) describe digital innovation as the creation of something new and valuable through digital technology, which will build upon organizational or societal needs, making digital innovation a fundamental powerful concept within the field of information systems (IS). Yoo et al. (2012) emphasize the need to incorporate digital technology into the very core of an organization's products, services and work processes. The term 'digital innovation' refers either to the use of digital technology during the process of innovation or to innovation whose result is fully or partly digital (Nambisan et al., 2017). In reference to Schumpeter (1934), digital innovation can be defined as the use of new combinations of digital and physical components to create novel products (Yoo et al., 2010). Despite increasing interest in digital innovation, in both the academic environment and public debate, digital innovation is emerging as a research area but is not yet fully developed (Holmstrøm, 2018). Nambisan et al. (2017) also argue that, through digitization, the relationship between the innovation process and the outcome of the innovation is more complex and dynamic. Kohli and Melville (2019) show that digital innovation includes activities including initiating, developing, implementing and exploiting. They state that these four activities need not be present in all digital innovation efforts, need not occur in any sequential order and may be difficult to disentangle in practice. They also point out that the existing organization is a critical backdrop of digital innovation, comprising strategies, cultures, and ways of doing things that can have a significant impact on digital innovation. Organizations must be aware that this context can influence, and be influenced by, digital innovation initiatives (Kohli and Melville, 2019). Digital innovation as a concept is based on specific characteristics of digital technology that shape the process and outcome: exponential growth of computing power, network effects, re-programmability, data homogenization and the self-referential nature of digital technology (Yoo et al., 2010; Fichman et al., 2014). The unique features of digital technology affect digital innovation, both in process and outcomes (Hedlund, 2019).

Employee-Driven Digital Innovation

Research into employee-driven innovation concentrates on the ways in which organizations can encourage innovative practices among ordinary employees (Høyrup, 2010; Kesting and Ulhøi, 2010). Employee-driven innovation is a concept that has emerged as organizations have increasingly recognized that innovation should not only be a reserved activity for their experts or R&D units (Birkinshaw and Duke, 2013; Haapasaari et al., 2018). According to Östberg et al. (2010), those organizations that are best at exploiting the ideas of their employees receive as many as fifty ideas per year, when the average

number of ideas created per year within each organization is only one. This finding is supported by several studies which indicate that employees are key players in developing and implementing innovations (Høyrup, 2012; Smith et al., 2012). The core concept of employee-driven innovation is that the innovation performance of companies will improve greatly when cooperation between employees and managers is encouraged (Hansen et al., 2017). Innovation is increasingly understood as the exchange of knowledge between organizations, as well as within them (Amundsen et al., 2014). Within organizations, a bottom-up approach, as represented by employee-driven innovation, can lead to the development of new products, services, processes or business models (Gawke et al., 2017). However, only limited attention has so far been paid to employee-driven innovation in innovation management (Bäckström and Bengtsson, 2019).

According to Reibenspiess et al. (2019), research into employee-driven innovation within IS and the public sector is limited. Large private organizations, such as Google, have dedicated a proportion of their employees' working hours to innovation. For example, Google has introduced the concept of "Innovation Time Off", in which their software engineers can use up to 20% of their time to develop innovative and organization-related ideas and projects of their own (Nightingale, 2008). Similar practices do not appear to exist in the public sector.

On the basis of the concepts of employee-driven innovation and digital innovation, we define employee-driven digital innovation as ordinary employees driving the process of initiation, selection, experimentation, development and implementation of novel ideas to create new digital products, services or processes, or innovation processes that are supported by the use of digital tools.

Research Method

Our strategy is to address our research question through the qualitative study of a public organisation which has engaged in several internal innovation projects. This paper is part of an ongoing research project studying employee-driven digital innovations within one of the biggest Norwegian municipalities, located in one of Norway's largest cities. According to statements from its council, the municipality has focused heavily on innovation in recent years and has a clear ambition to become more innovative and to increasingly attempt to exploit the innovation potential of its employees. We have collected empirical data using interviews (Yin, 2011).

The case study is a popular research method which is particularly attractive for applied disciplines, as processes and problems can be studied to provide an understanding which can improve practice (Ponelis, 2015). The single-case study is also an accepted strategy within IS literature, as it allows researchers to gain deeper knowledge about information systems within their socially embedded contexts (Orlikowski and Iacono, 2001). The case study of the municipality has given us access to ten ongoing digitalization projects. Among these there are also innovation projects, as they seek profit realization through either service innovation or process innovation. We were able to identify four projects originating from ideas created by ordinary employees in the various units that comprise the municipality and were in different phases of realization. Somewhere in the start-up phase while others were already in the implementation phase. These four selected projects clearly were identified as employee-driven digital innovation projects, in consultation with the programme manager. Interviewing employees performing employee-driven digital innovation, as well as key contributors in the projects, such as project managers allowed us to gain specific knowledge about drivers and barriers for employee-driven digital innovation.

The four projects that were selected had different vision and approach to the purpose. The first project was the development of a digital service used by the municipality's restaurants, the second was the development of a new digital case processing system for applications related to construction, the third was the development of a digital case processing system used by the municipalities politicians and the fourth was the development of digital services for refugees residing in the municipality.

Data Collection

The research process for this study is described in Figure 1. The method used for data collection was interviews about employee-driven digital innovation initiatives. According to Creswell and Creswell (2018), the aim of qualitative research is to deliberately select the participants or material that will best enable the researcher to understand the problem and research question. The data in this study was obtained in December 2019, using semi-structured interviews with eleven participants in the four selected projects. The recruitment strategy was based on identifying key people in each project, as well as others in the organization who worked closely with the projects. In total, eleven semi-structured interviews were performed with employees who had a range of job functions related to the various digital projects. Table 1 summarises the different job functions of the interviewees’.

Table 1. Summary of interviewees` profiles

| Interviewees | Interviews |
|-----------------------------|------------|
| Program manager | 1 |
| Project manager | 4 |
| Project member | 5 |
| Internal software developer | 1 |

Programme and project managers were included in the study, as well as ordinary employees who had initiated and led the innovation projects. This was done to determine whether other stakeholders could identify and enrich possible drivers or barriers identified by ordinary employees. Interviewing people that not normally are considered can help to achieve data saturation Bernard (2012). According to Fusch and Ness (2015) the number of interviews needed to reach data saturation cannot be quantified, but where more is better than less. The sample of study participants contained a range of age and experience and included both women and men. The interview protocol was developed as a guide for the semi-structured interviews and is available from the authors on request. Some of the questions from the interview guide are reproduced in Table 2. The use of semi-structured interviews allowed the researchers some flexibility to deviate from the protocol in the interview situation and go into greater depth, so that new insights into employee-driven digital innovation could be further explored. The interviews were audio-recorded, with the permission of the interviewees, and later transcribed for analysis in Norwegian. The interview length varied between 23 and 64 minutes, with an average length of 42 minutes. The first author coded the interviews and involved the other authors in weekly meetings.

Table 2. Examples of questions from the interview guide

| |
|--|
| <i>“How would you describe the municipalities’ focus on innovation?”</i> |
| <i>“Has the municipality created any arenas for innovation?”</i> |
| <i>“How can the municipality create more innovation initiatives among ordinary employees?”</i> |
| <i>“What do you experience as the obstacles to employee-driven digital innovation initiatives?”</i> |
| <i>“What do you experience to be the drivers of employee-driven digital innovation initiatives?”</i> |

Data Analysis

Qualitative research is, by nature, a form of interpretative research (Creswell and Creswell, 2018). In the analysis of the interviews, we used the application NVivo12. We used NVivo12 both to structure the process of the coding and thematic analysis. The extracted data was synthesized through thematic analysis based on the guidelines set out by Cruzes et al. (2014). Thematic analysis is a method of identifying, analysing and reporting patterns (or themes) within data (Braun and Clarke, 2006). Existing theory about the identification of innovation drivers and barriers in employee-driven innovation

(Reibenspiess et al., 2019; Wihlman et al., 2014) was used as a starting point in the identification of themes in the coding process. At the same time, we were open to identifying other possible drivers and barriers to employee-driven digital innovation. In other words, the starting point for the thematic analysis was existing theory. During the analysis of the interviews, however, we were still open to identifying other factors as drivers or barriers, so that the thematic analysis should not be simply a verification of existing theory.

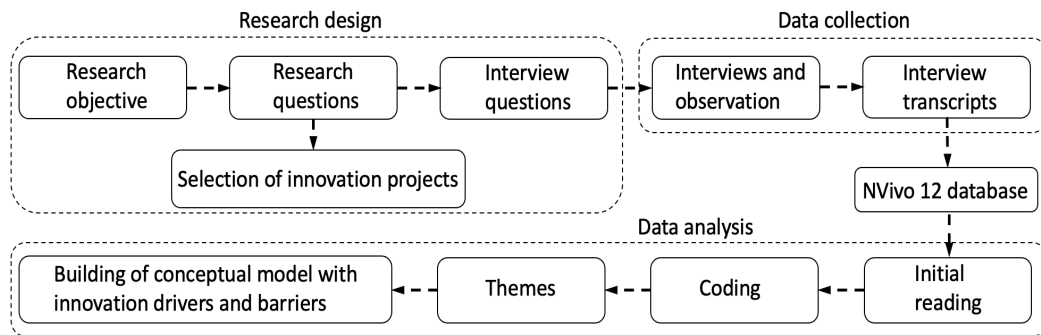


Figure 1. Research process

Findings

The characteristics of public organizations can be assumed to shape the innovation context that influences employee-driven digital innovation. If one limits the innovation context to the organizational form, there is theoretical support for claiming that fundamental differences exist between private and public organizations that could affect the preconditions for employee-driven digital innovation (Lee et al., 2012; Kankanhalli et al., 2017; Bertot et al., 2008). We believe that both innovation drivers and barriers will affect employee-driven digital innovation, also within a public organizational context. In the following sections, the drivers and barriers we have identified are presented with reference to the thematic analysis. Following existing theory, we believe in particular that the absence of digital tools to support the innovation process has not previously been identified as a barrier.

Employee-Driven Digital Innovation Drivers

Engaged employees – Innovation champions

The goal in the municipality is to promote employee-driven digital innovation so that it becomes the permitted way of working with innovation. Despite this goal the realization of innovation potential appears to be connected to individuals. There are examples in the data showing that employee-driven digital innovation as a concept has not been incorporated nor the fact that a public organization should work with innovation. One respondent said: *“To be completely honest, I find that there is a lot of talk about innovation and less action.”* Another respondent described the municipality's innovation focus as *“a blue whale on land trying to turn around”*. Here, the understanding of what digital innovation is probably plays a role; some people probably think about digital innovation only to the extent that it involves technological development. In any case, there seems to be a divergence between the senior management's strategic approach to innovation as a central part of the municipality, and the employees' experience of its strategic focus.

The findings in our study clearly indicate that employee-driven digital innovation in the municipality so far is linked to an unusual involvement of particular individuals or departments in the municipality. This can be explained by the fact that it has not yet been possible to build an innovation culture in the municipality. These engaged employees appear to be innovation champions (Reibenspiess et al., 2019) within the organization, and are constantly searching for innovation. These are ordinary employees, and

do not have innovation as part of their job description, but still have an inherent desire to be a driving force in the innovation processes in the municipality.

The needs of citizens

One of the great advantages that public employees possess when they create and develop digital products and services is that, in many cases, they are themselves users of those products and services. They are also in close contact with citizens who also use the products and services, and this dual role gives them a unique knowledge of users' needs. Within information systems, there has been a movement towards more user-centric development (Djamasbi et al., 2016)). Many of the services developed within public organizations, either for internal process improvement or external service development, are linked to the use of information systems. The benefit which derives from the fact that the employees are both users of the services and have close contact with other service-users, is higher value creation in service development. When asked who initiates the projects, one of the respondents replied: *"Those who work with the subject area and see that there's a need for it."* The employees' in-depth knowledge of user experience can be essential for participation in these innovation processes. Several of the respondents in the study pointed out that being able to precisely understand users' needs has been decisive in the development of services. This was especially evident in one of the projects in the programme where services were developed to support users with particularly low digital skills. *"This has been spun out of perceived needs: the aim was not to be innovative"*, one respondent recalled. Therefore, it seems that knowledge of internal work processes and user needs is crucial for involvement in employee-driven digital innovation.

Technological development

Public organizations are seldom engaged in the development of new technology. This is the right priority, given their fundamental goals. This means that those organizations rely to a large extent on absorbing technological development from other actors, including the private sector or research institutions (Glabiszewski et al., 2020), including software and hardware start-up companies that can drive technological development and contribute to economic growth and innovation (Berg et al., 2018). Several respondents highlighted the municipality's IT department as one that showed special interest in, and curiosity about testing and using new technology. One respondent replied: *"There's a very low threshold for using new things, but I also think that the whole municipality as an organization is quite good at using new things."* One of the reasons for this curiosity might be a close connection to research environments that are a long way ahead technologically. This may be peculiar to this particular municipality, however. Curiosity is an important ingredient in the process of getting to know new technology and its limitations, and identifying potential uses for it. A municipality contains a wide range of different fields of knowledge, and many employees will probably lack specific knowledge about new technology or digital skills. Several of the respondents pointed out, among other things, that technological insights and knowledge are not a barrier to contributing to the development of digital products and services. One respondent told us: *"Technology came afterwards, the physical side of things. We worked a lot on paper with the idea in the beginning. This showed us how we work, and what the different processes are."* The crucial thing in relation to employee-driven digital innovation in a public organization does not seem to be deep knowledge of technology, but professional knowledge and understanding of user needs and the flow of the work processes. The selection of appropriate technology to solve identified challenges will come later.

Management support

The respondents who state that their unit had an innovation focus say that management was important both because it prioritised innovation, but also because it supported employees who wished to develop their ideas for good products and services. One employee said, *"We're encouraged to do it"*, when asked if their manager supported employee-driven digital innovation. In other words, employees see a close link between management support in relation to innovation processes and the opportunities to

develop their ideas. The management in the municipality has worked to create a focus on innovation, supporting it through explicit measures such as an innovation day and leadership development seminars. The goal has been to develop an innovation culture that includes all the organization's employees, but the individual middle managers are responsible for putting this into practice in the different units. This may have been more challenging for some managers than others. In their development seminars, the leaders have focused on employee-driven innovation. Nevertheless, they have largely been left to their own when implementing the methodology in the units. The result has been a varying level of focus on innovation in the various units. The respondents clearly confirm that management support is a crucial influence on their ability to be innovative and further develop their innovative ideas.

Employee-Driven Digital Innovation Barriers

Lack of innovation culture

The core activities in public organisations, and municipalities in particular, seldom involve innovation. They are focused on delivering services such as transport, schools and health care. When these are the core activities of an organization, creating a culture that embraces innovation becomes challenging. Several of the respondents claimed that no culture of innovation exists in the organization. When asked about the biggest barrier to innovation in the municipality, one respondent answered "*Engagement*". Another respondent said: "*Now, I don't say that anyone's hostile to innovation, but the focus is not on new developments. It's on strengthening current practice.*" This lack of an innovation culture probably results partly from the primary purpose of public organizations. Innovation has never been seen as a major activity in such organizations and changing this perception of culture within them is a major undertaking. A well-known concept in strategy theory is that "culture eats strategy for breakfast". It does not matter which strategies the senior management of the municipality intend to implement, if they are not related to the lived behaviour represented in its culture.

Lack of financial support

Many of the innovation processes in public organisations are initiated to create efficiency and cost reductions. This, of course, reflects the reality that these organizations are largely unable to drive innovation. One factor highlighted by several respondents as a clear barrier to innovation in the municipality is a lack of financial support. The various units have little funding dedicated to development and must apply for funding centrally in the municipality to conduct development work such as preliminary projects. This bureaucratic approach to innovation is described by several respondents as being an obstacle when it comes to innovation. One respondent describes this as follows: "*There is not much money, so you must be able to take yourself and the person you work with and be quite innovative in terms of finding solutions together.*" The units cannot take the initiative quickly when ideas emerge, so employees must frequently work beyond the standard working hours to further develop their ideas. The municipality has earmarked money for the development of ideas, but it specifies that the ideas must already have been part of a preliminary project, and increased efficiency and/or reduced costs must be clearly predicted to be benefits of the project. This could mean innovation is prioritised when it focused on particularly profitable areas, such as process innovation.

Bureaucracy

Another identified barrier to employee-driven digital innovation in the public sector is bureaucracy. On the one hand, there is the organizational complexity of a large municipality, while on the other hand there is a plethora of laws and regulations that often hinder creativity and the search for innovative digital solutions. To navigate this sea of rules and regulations, it is often necessary to cooperate both internally and externally. Collaboration with other municipalities in development projects was described by several of the respondents. One respondent told us: "*These barriers are common: our work is based on different legal frameworks, or we are focused on different goals, or we do not manage to cooperate because some structural conditions prevent this.*" Public organizations are also largely characterized by

goal management. This may be one of the bureaucratic processes of public organizations that hinder innovation. One of the respondents described how bureaucracy can hinder employee-driven digital innovation: *“I think there are bureaucratic, legal and organizational obstacles to innovation.”*

Digital tools which support innovation

Innovation processes often rely on collaboration to deliver results (Smirnova et al., 2018). The municipality currently has no suitable digital tools which could enable employee-driven digital innovation. One respondent told us: *“It’s the old-fashioned piece of paper in a box.”* In other words, there are no digital tools for idea generation, idea evaluation, collaboration, experimentation or the like. Instead, they use a Facebook channel for this purpose, but even this was an initiative of employees who wanted to discuss innovation in the municipality. This is an informal channel and not one that everybody in the municipality can access. If digital tools are to be utilized to support innovation processes, it is crucial that everyone has the same prerequisites and access to the tools. These tools can be strong culture-builders, because people can find out about innovation elsewhere in the organization and share success stories.

Discussion

Our findings are in accordance with, and comparable to, the findings of previous research with similar approaches (Wihlman et al., 2014; Reibenspiess et al., 2019), which focused on the drivers and barriers to employee-driven innovation within public organizations. Our study identified four drivers of innovation and four barriers to innovation. Although we have not examined the balance of power, one interesting finding of the study is that, even though the respondents have identified several barriers to innovation, they have also found different workarounds (Alter, 2014) to develop their ideas. For example, one barrier we have identified is a lack of digital tools to support the innovation process. This was also shown by Reibenspiess et al. (2019) to be a barrier to innovation. We discovered that Facebook is used as a workaround to this barrier in the municipality. This medium is a channel which employees in the municipality can use to share, discover, test and investigate. Posts in this channel include inspirations from innovation research, media articles, notices of events related to innovation, examples of innovations from other municipalities or public organizations, and the sharing of ideas, among others. The challenge of using Facebook for this purpose is that it must be actively sought out, so that the users are only people who are directly involved in innovation projects in the municipality.

The use of Facebook as a channel for collaboration seems mainly to be linked to employees with a strong commitment to innovation – those employees we have called innovation champions (Reibenspiess et al., 2019), and identified as drivers of innovation. Public bodies are often complex organizations consisting of many people, not all of whom wish to participate in innovation processes. Innovation can to some extent be part of their job descriptions, but they may have various reasons for not wanting to get involved in it. An increasing external pressure to innovate can also contribute to a change in mindset among public employees. Nevertheless, it still appears as if employee-driven digital innovation is closely linked to the strong commitment and willingness of the innovation champions in public organizations.

We see in our study that those employees who act as innovation champions in the organization seem to have a good understanding of the needs of users. These are people who have been in close contact with users and know the nature of their interactions with the municipality as well as their intrinsic needs. This makes them particularly capable of defining the requirements of digital solutions for the delivery of good services. At the same time, these employees have good knowledge of the municipality's internal processes. The fact that these employees have knowledge both of user needs and of the municipality's internal work processes and their potential improvement means that they are invaluable for the development of quality digital services for the future (Bevan, 1999). According to the respondents the lack of technological understanding or insight is not a barrier to innovation, so long as the municipality has employees who experiment with new technology and apply it in projects related to digital innovation. In smaller public organizations whose employees do not have similar capabilities, however, this could constitute a barrier rather than a driver. Perhaps the most important element of digital innovation and

digitalization is that the municipality should continue collaborating with environments (such as universities and research institutes) that are developing and using digital technologies, while also having departments containing employees who are curious about the potential uses of new technology. The realization of this innovation potential will then not be limited to the technological understanding and digital skills of individual employees. Instead, through collaboration, employees with technological understanding can be connected with employees who understand the user needs and internal work processes. Sharing knowledge of new technology, as well as success stories about digital innovation in the municipality, could enhance collaboration, visibility and transparency there and be an important step towards an innovation culture (Carayannis and Meissner, 2016; Kratzer et al., 2017). If a digital tool for employee-driven digital innovation could be made available to everyone in the municipality, it could support the development of an innovation culture. However, as mentioned earlier, the municipality lacks such a tool, even though it could lead to increased creativity and an exploration of the possibilities offered by new digital technologies. According to Dobni (2008), building a culture of innovation entails the creation of an environment and infrastructure that encourages employees to support the thinking and action necessary for innovation. It will not be sufficient just to provide a digital artefact which supports the process of employee-driven digital innovation, because, as West and Richter (2009) argue, innovation is most likely to occur in a work context that encourages novel and creative outcomes. Innovation culture is inherently complex and requires appropriate strategies and actions that allow the practice of innovation within the organization. Our insights into these employee-driven digital innovation projects show that such success stories exist. Unfortunately, however, very few employees are allowed to take part in these successes. The dissemination of ideas happens at random, which also contributes to the disappearance of valuable input that will enable the further development of ideas.

By investing in the development of innovation culture in various ways (e.g., Carayannis and Meissner, 2016; Kratzer et al., 2017), the municipality could also use some of the drivers of innovation to strengthen the culture. For example, employees who are really passionate about innovation and who have a commitment to work with development could be empowered and become more visible exponents of innovation in the organization. This could, in turn, give them more opportunities to be innovative. This means that the units in the municipality need to have equal opportunities to develop their ideas further, and this must be supported by both the senior and middle management of the organization. Management support (Høyrup, 2012) appears as one of the most prominent drivers in our study. The respondents clearly state that a lack of management support from senior management is much more important than a statement of support for innovation from senior management. It is the employees' closest leader who can provide the space in their everyday working activities in which they can develop and take part in digital innovation processes. Line managers are therefore most capable of making innovation initiatives happen within the organization.

The municipality has taken several measures that will lead to increased employee-driven digital innovation in both the short and long term. These measures will be of interest to practitioners and act as suggestions for similar organizations. Firstly, they have implemented the methodology and mindset needed for employee-driven digital innovation at the management level. They still have some way to go before this comes into operation at all levels, but the necessary processes have started. They have established a central unit that ensures that the most valuable ideas are realized. This will also lead to good opportunities for knowledge transfer and collaboration between the project and employees. Finally, they have started to allocate funds so that individual units can further develop ideas and investigate whether they have the potential to be realized. Nevertheless, the municipality has still a long way to go before it fully implements the mindset of employee-driven digital innovation within the organization. Public organizations are characterized by bureaucracy, and this can in many ways be a challenge for innovation (Lapueute and Suzuki 2020).

For practitioners, the most important finding of this study will be that employee-driven digital innovation can also yield results for public organizations. At the same time, it is important to facilitate this type of innovation by focusing on the drivers that lead to innovation: in particular, engagement, focus on user needs and management support. Barriers clearly exist, but many of them can be lowered by working with the development of culture, financial support and the use of digital tools to support innovation.

In this study, we have not spent much time discussing why public organizations innovate. We have consistently argued that employee-driven digital innovation is rooted in the ideas of public organizations about the development of better services or more efficient processes. Organizations are vital in the development of new ideas, and so institutional theory gives a better explanation of the interrelations between the different actors in society (Scott, 2013). We believe that the goal of innovation is part of the context in which employee-driven digital innovation takes place. Our argument is therefore that the goal of innovation will also affect the drivers of innovation and the barriers to it.

Conclusions, Limitations and Future Research

Conclusions

Our study confirms the findings of recent research (Reibenspiess et al., 2019) into the increasing focus on digital innovation within the public sector. This seems to be driven by the fact that innovation can improve the quality of services in the public sector and enhance its capacity to solve problems (Damanpour and Schneider, 2009). For innovation purposes, public organizations need to be in a position that enables them to quickly adopt and implement new technology when it becomes available.

Through our study, we have been able to identify four drivers of innovation and four barriers to innovation at the institutional, organizational and individual levels, which can affect innovation outcomes in the public-sector context. The findings in our paper support previous studies that have focused on the drivers and barriers to employee-driven innovation (Reibenspiess et al., 2019; Wihlman et al., 2014).

Our findings suggest that employees who are engaged with innovation are important drivers of it. The fact that employees in public organizations are familiar both with their internal work processes and with the needs of users makes them particularly capable of contributing to these innovation processes. This insight and engagement must be supported by management. However, it is surprising that only a limited basis exists for the claim that digital skills or technological knowledge and insight are perceived as barriers to employee-driven digital innovation. The driver seems to be that knowledge about the technological development is present in the organization and can be applied to identified problems.

Our findings also provide insight into the barriers to innovation, including the absence of an innovation culture. This is supported by the fact that employees who are engaged in innovation are not themselves aware of their activities within the organization. Similarly, a lack of financial support and a bureaucratic organization present challenges to innovation. The introduction of a digital tool for innovation support could help to lower some of these barriers. However, the absence of such a tool seems to be a barrier in itself.

However, our case study seems to show that employees can be valuable players in the creation of quality digital services, who are at the forefront of digital innovation within public organizations.

Limitations

This paper is based on ongoing research, and further data will enhance the validity of the findings. Our data is based on a single-case study of a public organization in Western Europe, and therefore the cultural impacts of other regions are not considered in this study. In this study, we have interviewed employees involved in employee-driven digital innovation projects. Other employees in the organization could probably have identified other/or more innovation drivers and barriers. To address this limitation, further research could aim to validate our findings among other employee groups within public organizations. We encourage researchers to find further innovation drivers and barriers, thus extending our empirical findings. Here, future research could investigate the influence of other constructs and thus test the reliability of our findings.

Future Research

We have revealed that drivers and barriers to employee-driven digital innovation exist in public organizations, but we have not looked at the balance of power between them. Our assumption has been that as long as the drivers are stronger than the barriers, employee-driven digital innovation will be feasible. The balance of power between these drivers and barriers will be interesting to examine. Similarly, a larger sample of respondents in a later study will be able to say more about the validity of the findings, and possibly reveal drivers or barriers in the data that have not yet been discovered. Furthermore, future studies may take a quantitative approach and examine the dissemination of employee-driven digital innovation in public organizations. By employing Fuzzy-Set Qualitative Comparative Analysis (fsQCA) (Pappas & Woodside, 2021; Ragin, 2009) future studies may examine which of the drivers and barriers, or their combinations, are necessary or sufficient to explain employee-driven digital innovation. Finally, when considering the role of big data in the public sector (Janssen et al, 2017), future studies may explore the role of public organisations as data actors within big-data analytics ecosystems (Pappas et al., 2018), since digital innovation plays a critical role in different stages of value creation.

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